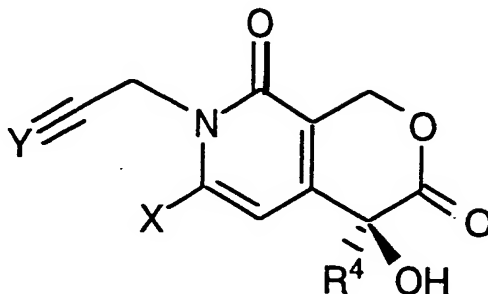


WHAT IS CLAIMED IS:

1. A method of synthesizing pentacyclic compounds via a 4+1 radical annulation/cyclization wherein the precursor



is reacted with an aryl isonitrile, wherein X is selected from the group consisting of Br and I, Y is selected from the group consisting of -N and -C-R<sup>3</sup>, R<sup>3</sup> is selected from the group consisting of hydrogen, a normal alkyl group, a branched alkyl group, an allyl group, a benzyl group, an alkynyl group, a propargyl group, an alkoxy group, a halo group, a silyl group, an amino group, a cyano group, and an acyl group and R<sup>4</sup> is selected from the group consisting of an alkyl group, an allyl group, a propargyl group and a benzyl group.

2. The method of Claim 1 wherein the reaction of the precursor with an aryl isonitrile takes place in the presence of a coreactant having the formula:

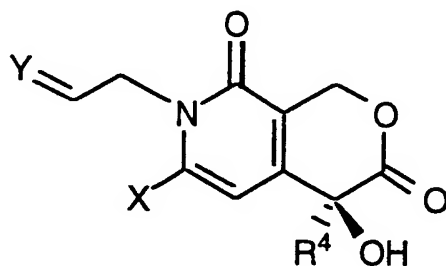


wherein M is selected from the group consisting of Si, Ge and Sn and R is selected from the group consisting of an aryl group and an alkyl group.

3. The method of Claim 2 wherein R<sub>3</sub>M-MR<sub>3</sub> comprises hexamethylditin.

4. The method of Claim 2 wherein R<sub>3</sub>M-MR<sub>3</sub> comprises hexabutylditin.

5. The method of Claim 2 wherein  $R_3M-MR_3$  comprises hexamethyldisilane.
6. The method of Claim 1 wherein  $R^4$  is an ethyl group.
7. The method of Claim 6 wherein  $R^3$  is hydrogen and the aryl isonitrile is 4-methoxyphenyl isonitrile.
8. The method of Claim 6 wherein  $R^3$  is an ethyl group and the aryl isonitrile is 4-methoxyphenyl isonitrile.
9. The method of Claim 6 wherein  $R^3$  is a 4-methylpyrazinomethyl group and the aryl isonitrile is 1,4-benzodioxan-6-isonitrile.
10. The method of Claim 6 wherein  $R^3$  is a 4-methylpyrazinomethyl group and the aryl isonitrile is 3,4-(methylenedioxy)-phenylisonitrile.
11. A method of synthesizing pentacyclic compounds via a 4+1 radical annulation/cyclization wherein the precursor



is reacted with an aryl isonitrile, wherein X is selected from the group consisting of Br and I, Y is selected from the group consisting of  $-CH_2$  and  $-CHR^3$ ,  $R^3$  is selected from the group consisting of hydrogen, a normal alkyl group, a branched alkyl group, an allyl group, a benzyl group, an alkynyl

group, a propargyl group, an alkoxyl group, a halo group, a silyl group, an amino group, a cyano group, and an acyl group and  $R^4$  is selected from the group consisting of an alkyl group, an allyl group, a propargyl group and a benzyl group.

12. The method of Claim 11 wherein the reaction of the precursor with an aryl isonitrile takes place in the presence of a coreactant having the formula:



wherein M is selected from the group consisting of Si, Ge and Sn and R is selected from the group consisting of an aryl group and an alkyl group.

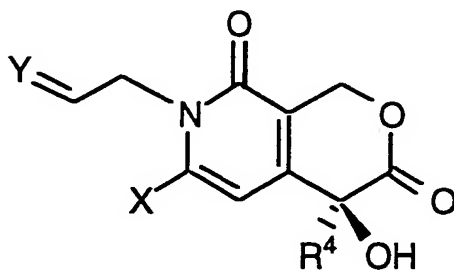
13. The method of Claim 12 wherein  $R_3M-MR_3$  comprises hexamethylditin.

14. The method of Claim 12 wherein  $R_3M-MR_3$  comprises hexabutylditin.

15. The method of Claim 12 wherein  $R_3M-MR_3$  comprises hexamethyldisilane.

16. The method of Claim 11 wherein  $R^4$  is an ethyl group.

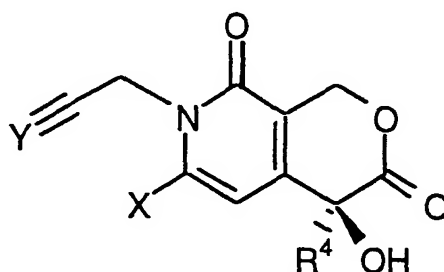
17. A chemical compound having the formula



wherein X is selected from the group consisting of Br and I, Y is selected from the group consisting of  $-\text{CH}_2$  and  $-\text{CHR}^3$ ,  $\text{R}^3$  is selected from the group consisting of hydrogen, a normal alkyl group, a branched alkyl group, an allyl group, a benzyl group, an alkynyl group, a propargyl group, an alkoxyl group, a halo group, a silyl group, an amino group, a cyano group, and an acyl group and  $\text{R}^4$  is selected from the group consisting of an alkyl group, an allyl group, a propargyl group and a benzyl group.

18. The chemical compound of Claim 17 wherein  $\text{R}^4$  comprises an ethyl group  $-\text{CH}_2\text{CH}_3$ .

19. A chemical compound having the formula

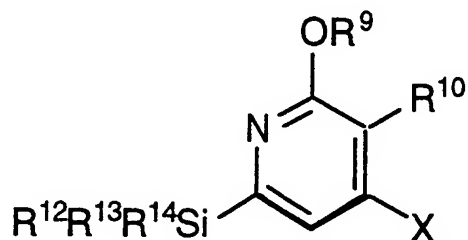


wherein X is selected from the group consisting of Br and I, Y is selected from the group consisting of  $-\text{N}$  and  $-\text{C}-\text{R}^3$ ,  $\text{R}^3$  is selected from the group consisting of hydrogen, a normal alkyl group, a branched alkyl group, an allyl group, a benzyl group, an alkynyl group, a propargyl group, an alkoxyl group, a halo group, a silyl group, an amino group, a cyano group, and an acyl group and  $\text{R}^4$  is selected from the group consisting of an alkyl group, an allyl group, a propargyl group and a benzyl group.

20. The chemical compound of Claim 19 wherein  $\text{R}^4$  comprises an ethyl group  $-\text{CH}_2\text{CH}_3$ .

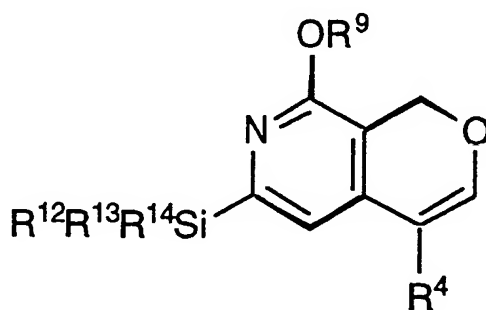
21. The chemical compound of Claim 19 wherein  $R^3$  is selected from the group consisting of hydrogen, an ethyl group, a trimethylsilyl group, nitrogen,  $-CH_2Cl$  and a 4-methylpyrazinomethyl group.

22. A chemical compound having the formula



wherein  $R^9$  is selected from the group consisting of a normal alkyl group and a branched alkyl group and wherein  $R^{10}$  is selected from the group consisting of  $-CHO$  and  $-CH_2OCH_2CH=CHR^{11}$ , wherein  $R^{11}$  is selected from the group consisting of an alkyl group, a vinyl group, an ethynyl group and a phenyl group, wherein  $R^{12}$ ,  $R^{13}$  and  $R^{14}$  are independently selected from an alkyl group and an aryl group, and wherein  $X$  is selected from the group consisting of  $I$  and  $Br$ .

23. A chemical compound having the formula



wherein  $R^9$  is selected from the group consisting of a normal alkyl group and a branched alkyl group, wherein  $R^4$  is selected from the group consisting of an alkyl group, an allyl group, a propargyl group and a benzyl group and wherein  $R^{12}$ ,  $R^{13}$  and  $R^{14}$  are independently selected from an alkyl group and an aryl group.